Db2&You

Db2 13 Migration & Features Survey
From GA to Today

Tridex
May 22, 2025

Paul Bartak
Distinguished Engineer
Rocket Software
pbartak@rocketsoftware.com
db2andyou@rocketsoftware.com

Rocket® software
Z COE
Z Center of Excellence | **Db2&You**

™

Rocket presentation disclaimer

Db2&You | Z COE Z Center of Excellence

Rocket®software
Z COE
Z Center of Excellence

Mission

Partner with our customers, with a deep commitment to their success, to earn the distinction of trusted advisors who understand the customer's unique requirements and deliver impactful solutions.

Vision

Never let a customer down.

Who is the Rocket Z COE?

A team dedicated to sharing insight, guidance, and expertise to help clients maximize their mainframe investment

- 30+ team members with invaluable mainframe experience
- Experts in Db2®/IMS™/CICS® engines & products and security
- We support IBM Z® everywhere

Each member of the Rocket Z COE is:

- A thought leader
- A trusted advisor
- An IBM Z practitioner
- A fervent educator

Db2&You

Db2, meeting you, where you reside

- Business value of moving to a new version
- Best practices in how to get there
- Tracking over 200 line items (epics, APARs, features) from introduction to implementation
- Tools
  - Checklists
  - Project plan
  - Scripts
- Community and currency
- Extensions anticipated
  - Labs
  - Studies

- Introducing @ IDUG NA 2025 as a Sunday Seminar

Rocket software
Db2&You

db2andyou@rocketsoftware.com

Rocket software
Db2&You | **Z COE** Z Center of Excellence

Db2 13 for z/OS GA to Today Agenda

What's in 13, and how to get there

- What's in Db2 13
  - A survey of feature and when they apply
  - High level preparations
  - Review of the "Levels"
  - Considering APPLCOMPAT
  - Function Levels (GA & Post-GA)
  - New function APARs (not in function levels)
- How to get to Db2 13
  - Architecture
  - Readiness
  - Navigating function levels
  - DSNTIJTC, DSNTIJRT, and DSNTIJXZ changes
  - 7 Things

Db2 13 for z/OS Functional Inventory

Serviceability reigns*

1. Serviceability / Resiliency
2. Migration
3. Advanced Design
4. SQL
5. Utilities
6. Optimization
7. Security
8. Extension / Skills
9. Storage
10. System Profiles
11. Connectivity
12. Data Sharing
13. Hardware

Over 70% of capabilities have been delivered between GA & Today

Ranking Order		
Categories	Epics/Issues	Percentage
Serviceability	46	20%
Migration	33	14%
Advanced Design	29	12%
SQL	22	10%
Utilities	20	9%
Optimization	19	7%
Security	14	6%
Extensions/Skills	14	6%
Storage	10	4%
System Profile	8	3%
Connectivity	8	3%
Data Sharing	6	3%
Hardware	3	1%

*Based on Line Items, not Effort

Note slides follow

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Db2 13 for z/OS Line Items Breakdown

Continuous Delivery in Action

- Db2 13 has a history of delivering a new function level 2x per year
  - April
  - October
- New function APARs outside of FLs are delivered when ready

- Tracking over 230 Line Items / APARs
  - Over 210 delivered
- GA
  - 58 Line Items / APARs
- Post-GA
  - 153 Line Items / APARs
    - 34 within function levels
      - 22% post-GA, 16% overall
    - 119 outside of function levels
      - 78% post-GA, 56% overall

Stacked bar chart — Line Items/APARs (232):
- Not Delivered: 21
- Post-GA not in FL: 119
- Post-GA in FL: 34
- GA(100,500,501): 58
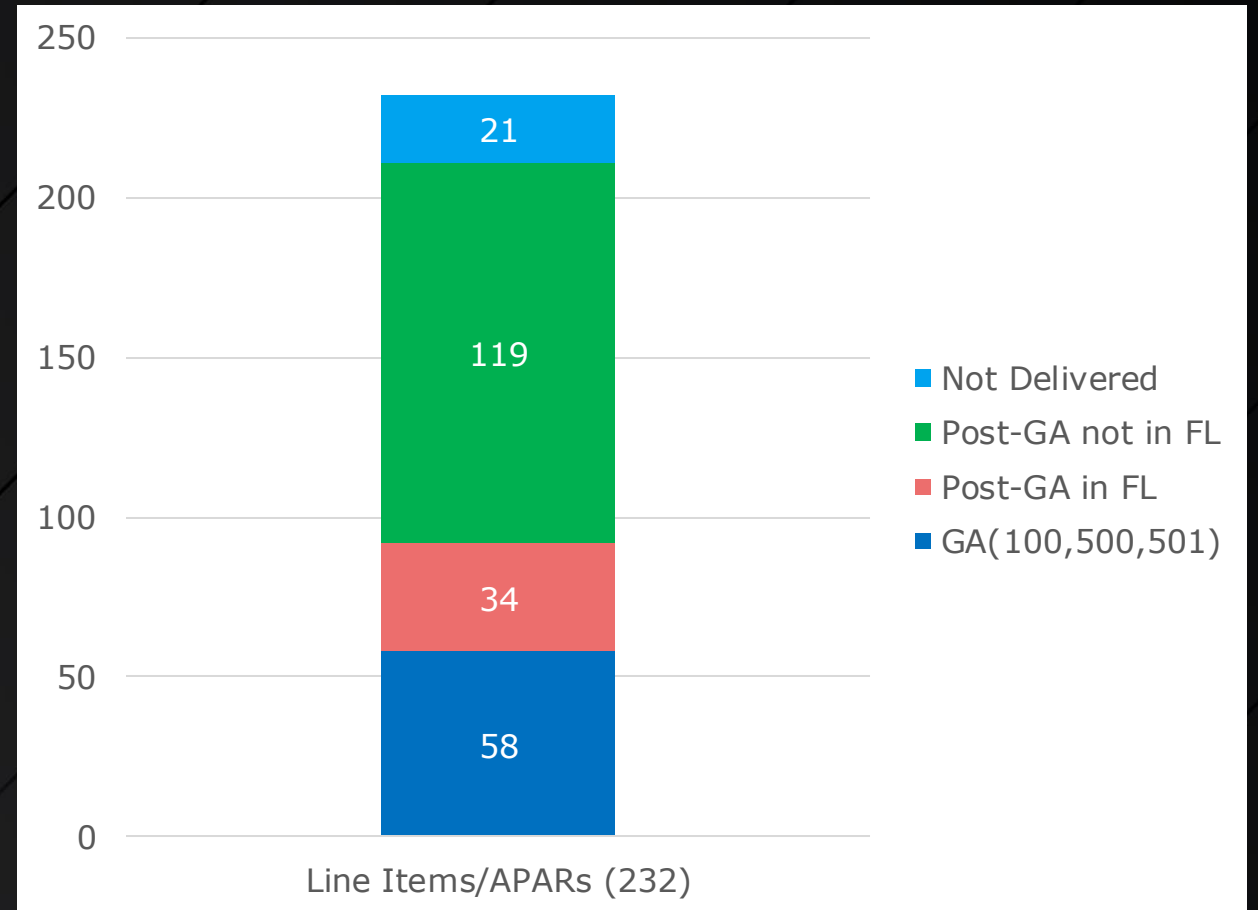
Db2® 13 for z/OS Announcement

Db2 13 Announcement Letter (AD22-0423, 222-003)
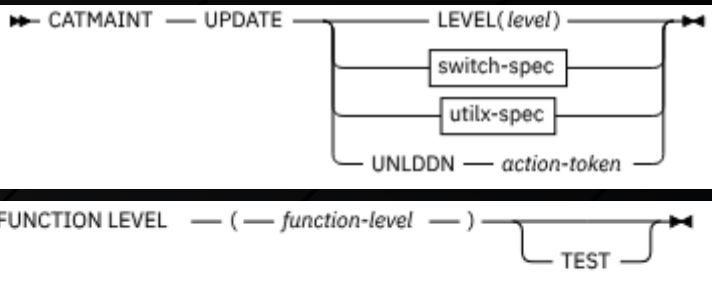
- 5698-DB2 / 5698-DBV Announced 4/2022, Available 5/2022
- zEC12 or higher, running z/OS V2.4 (5650-ZOS) or later*
- Plans/Packages bound V11 or later (see JPE/JPM report)
- EXPLAIN tables in Db2 12 or 13 format (see DSNTIJXA or ADMIN_EXPLAIN_MAINT)
- Db2 Utilities Suites for z/OS, 13.1 (5698-DUT)
- Expected real memory increase, with several ECSA relief features
    - Storage changed in Db2 13
- SQL Data Insights
- Several hardware and software prerequisites for
    - Performance improvements
    - Feature availability
- Continuous Delivery Model, continued from Db2 12 for z/OS
- Db2 12 for z/OS EOS (923-0481) planned for 12/31/2025
    - Marketing withdrawn 6/12/2023 (922-053)
- IBM Db2 Tools for z/OS Compatibility with Db2 13 for z/OS
- Program directories for Db2 13 (PDF)

IBM Support Product Lifecycle

Note slides follow

* Some features require high levels

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Db2 13 for z/OS Levels

ML, CL, FL, VL, EL, AC & how to drive them

- Maintenance Level — SMPE (Receive / Apply jobs)
- Catalog Level — CATMAINT (DSNTIJTC job)
- Function Level — ACTIVATE (Command or DSNTIJAF)
- Verification Level — FL activation driven as of FL504
- Effectivity Level — SMPE (Effectivity of non-FL APAR)
- Application-level enablement — BIND/SET
  - APPLCOMPAT
    - ZPARM default
  - clientApplCompat
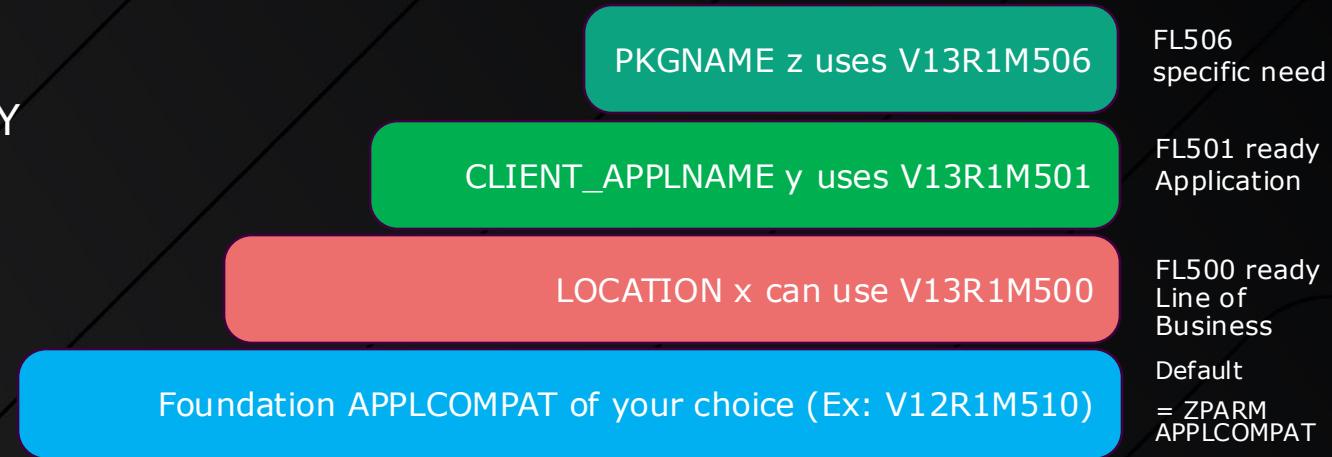 - DSNHDECP SQLLEVEL
  - No previous AC levels were removed

```
14.40.17 STC00135  DSN7100I  !DSAD DSN7GCMD  720
     720           *** BEGIN DISPLAY OF GROUP(........) CATALOG LEVEL(V13R1M505)
     720                              CURRENT FUNCTION LEVEL(V13R1M504)
     720                              HIGHEST ACTIVATED FUNCTION LEVEL(V13R1M504)
     720                              HIGHEST POSSIBLE FUNCTION LEVEL(V13R1M505)
     720                              PROTOCOL LEVEL(2)
     720                              GROUP ATTACH NAME(....)
     720           --------------------------------------------------------
     720           DB2          SUB                     DB2    SYSTEM   IRLM
     720           MEMBER   ID  SYS  CMDPREF   STATUS   LVL    NAME     SUBSYS IRLMPROC
     720           -------- --- ---- -------- -------- ------- -------- ---- ---------
     720           ........   0 DSAD !DSAD     ACTIVE   131505 SS01     IR01  DSADIRLM
     720           --------------------------------------------------------
     720           MIGRATION READINESS REPORT
     720           --------------------------------------------------------
     720           DB2         CODE       SPE       MIGRATION
     720           MEMBER      LEVEL      APAR      ELIGIBLE
     720           --------  ---------  --------  ---------
     720           ........  V13R1M505  ........   NO
     720           MIGRATION READINESS STATUS: SUBSYSTEM IS NOT READY FOR DB2 NEXT
     720           REASON: NO NEXT RELEASE OF DB2 IS CURRENTLY AVAILABLE
     720           --------------------------------------------------------
     720           SPT01 INLINE LENGTH:        32138
     720           *** END DISPLAY OF GROUP(........)
14.40.17 STC00135  DSN9022I  !DSAD DSN7GCMD 'DISPLAY GROUP ' NORMAL COMPLETION
```

APPLCOMPAT Management

To avoid surprises, manage APPLCOMPAT

- Management could be done through:
  - The APPLCOMPAT BIND parameter, or
  - SET CURRENT APPLICATION COMPATIBILITY
  - Application or driver properties
- System Profiles automates the SET option w/o app changes
  - Identify connections via several filters
  - Db2&You System Profiles section covers these capabilities
  - Methods:
    - Penalty box method, where certain threads are demoted to lower APPLCOMPATs
    - Promotion method, where certain threads are promoted to higher APPLCOMPATs
      - Db2&You recommended
      - Supported by Profiles qualifying based on most specific rules

PKGNAME z uses V13R1M506 — FL506 specific need

CLIENT_APPLNAME y uses V13R1M501 — FL501 ready Application

LOCATION x can use V13R1M500 — FL500 ready Line of Business

Foundation APPLCOMPAT of your choice (Ex: V12R1M510) — Default = ZPARM APPLCOMPAT

- Db2 12 only supports system profile APPLCOMPAT management for remote threads
- V13R1M500 adds system profile ability to direct APPLCOMPAT for local threads

Rocket software
Db2&You | Rocket software Z COE
Z Center of Excellence

Db2 13 for z/OS GA Functional Levels

New Functions vs. Function Levels

Db2 13 Function Levels

GA function levels
- FL100
- FL500
- FL501

Almost 80% of 13 new function APARs are NOT in a Function Level

Db2 13 V13R1M100

- INSERT improvements
- Virtual storage
- Optimization (sort optimization)
- Security compliance
- GBP residency times (z16)
- SORTL (z15)
- Continue to use Db2 12 IVP & Sample Programs until FL501+

Db2 13 V13R1M500

- SQL Data Insights
- Online PBG to PBR conversion
- Several IFCID changes
- Several Utility enhancements (not History)
- System profiles extended
  - Local threads
  - CURRENT LOCK TIMEOUT special register

Db2 13 V13R1M501

- Db2 13 IVP @ FL501
  - Can run @ FL500 with APPLCOMPAT changes
- Full 13 feature for the FL after activation
- RTS index split changes
- Full Profile enhancements with new Global Variables
- Utility History `1`
- Application deadlock control

New Function APARs (not dependent on a FL) can take effect immediately
Do not confuse Verification Level

100 500 501   502   503   504   505   506   507   5xx

Apply
100-based
PTF Immediately available

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Db2 13 for z/OS Post-GA Functional Levels

Summary of Post-GA Function Level Features

- 502
  - Db2-controlled Sysplex workload balancing
  - Package statement level dependency recording `1`

- 503
  - SELECT INTO…OPTIMIZE FOR n ROWS
  - Accelerator-only support for >32K IN list elements
  - New default for ALTER TABLE ADD COLUMN of a Row Change Timestamp

- 504
  - Package statement level invalidation `2`
  - 16 OP buffers (from 8)
  - Utility object level history `2`
  - SQL DI enhancements
  - ORDER BY support for LISTAGG

- 505
  - RACF identity token-based authentication
  - Temporal support for security related catalog tables
    - CATMAINT will DROP/reCREATE most existing history tables
  - New ZAI trace destination
  - INTERPRET scalar function

- 506
  - LOAD non-disruptive part clearing
  - Multi-row INSERT w/VALUES clause
  - Ease Column MASK restrictions
  - IN List predicate performance
  - More concurrent active traces
  - Implicitly hidden ROWID columns

- 507
  - Online PBR to PBG conversion
  - Set SYSPLAN LASTUSED
  - System Time enhanced concurrency
  - TS PRI/SEC QTY > 64GB
  - SQL reference to Temporal & Archive

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Db2 13 for z/OS Post-GA Non-FL Features…

Effectivity Level 100

- Advanced Design
  - DBADM view management for others
  - FTB reads SYSINDEXCONTROL more often
- Migration
  - DSNTXAZP enhanced discovery
  - Install CLIST batch execution
  - Db2 routine APPLCOMPAT in JRT
  - Disable GRANTs for install jobs
- Serviceability
  - PRDID value changes
  - MOD DDF ACCTG(ALLCOMMIT) enhanced monitoring
  - DIS THREAD distinguish active types of DDF DBATs (RP, RD, RH)
  - Latch boost message includes causer
- Storage
  - Reduced ECSA for DDF
- Security
  - Passphrase support for T3 driver
  - DISPLAY privilege covers PROFILE & DYNQUERYCAPTURE
  - TRUSTED CONTEXT subnet mask

- System Profiles
  - AUTHID monitoring for security profiles
- Connectivity
  - New client inventory IP address stats
  - Different IP address for LOCATION aliases (non-data sharing)
- Data Sharing
  - GRECP delay details
  - Refresh prefetch for XI pages
- Utility
  - Tape LOAD estimate improvement
  - LOAD reclaim NPI space
  - COPY zIIP offload
- Optimization
  - Lock avoidance for singleton SELECT ISO(CS) CD(YES)
  - EXPLAIN(ONLY) for REST, Adv Triggers
- SQL
  - APPLCOMPAT special register abbreviation

…Db2 13 for z/OS Post-GA Non-FL Features

Effectivity Level 500

- Advanced Design
  - Stacking changes with PBG to PBR
  - Replication CDDS expansion dictionary
- Migration
  - New UTIL_MODIFY_REC_DELETEDS ZPARM
    - IGNORE to the DELETEDS option of the utility
- Serviceability
  - DIS THREAD distinguish suspended threads (MAXDBAT vs. Profile)

- Data Sharing
  - Balanced P-lock hashing for PBR RPN
- Utility
  - MODIFY STATISTICS partition support
  - MODIFY RECOVERY, DELETEDS override

Db2 13 for z/OS Migration Summary

From Db2 12 for z/OS

- V12 ERLY code + PH42656 for V13, or use V13 ERLY Code (compatible with 12)
- V12 Fallback SPE (PH37108) + IRLM 2.3 PH43770
  - IRLM fix PH47973
- V12R1M510 (PH33727)
- 100 => 500 => Function level of choice
  - 501 represents the first GA-level of full features
- Fallback and coexistence from 100
- New function requiring coordination is delivered as a Function Level
  - Coordination
    - Catalog change (may not be structural)
    - Staging infrastructure
    - Data Sharing
  - Many new function PTFs take effect immediately, often back to FL100
    - Check the Effectivity Level
- Packages must be bound V11 or later
  - JPE/JPM report (requires DSNREXX preparation, see JTM)
- Data Server Driver 11.1.2, FP2 or later for new functions
  - Lower may be possible, higher may be required, check by feature

Db2 13 Migration Architecture

- ▪ Db2 13 continues an evolution of migration improvements
  - Minimizing the impact on Db2 12
  - While retaining fallback and coexistence capabilities
- ▪ V13R1M100 supports fallback & coexistence
  - No Catalog or Directory changes
  - With a small Db2 13 migration SPE

V12R1M510	V13R1M100	V13R1M500	V13R1M501	V13R1M50x

Db2 12 + SPE	Fallback & Coexistence	Db2 13

Migration->   Activation->   Activation->   Activation->

Db2 12 Support | Db2 13 Support

Rocket software
Db2&You | Rocket software
Z COE
Z Center of Excellence
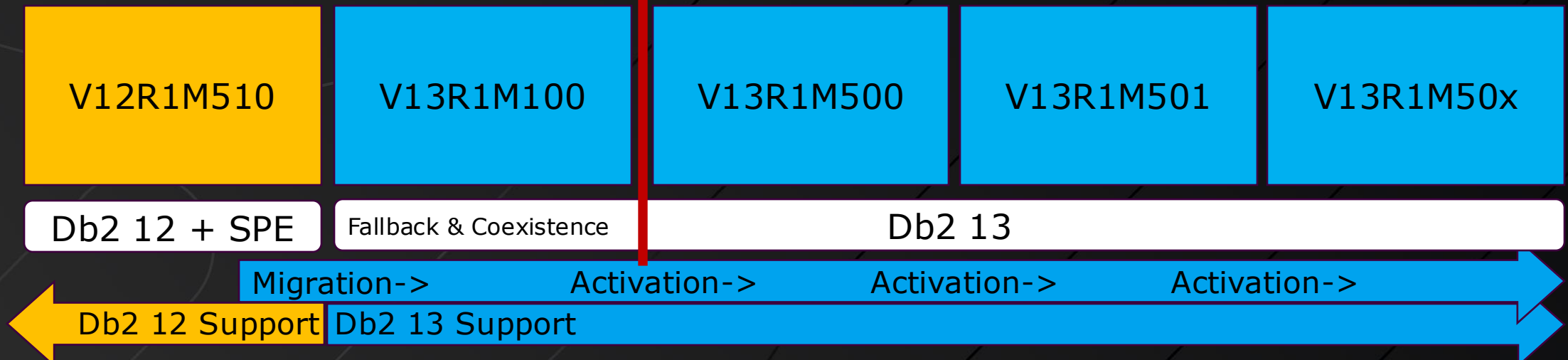
Enabling Fallback & Coexistence

Migration Phases, Call it Compatibility Mode or FL100

- Fallback has been supported for the majority of Db2's existence
- Coexistence has been supported since Data Sharing was introduced in V4
- Migration has changed dramatically with the evolution of the Modes & Function Levels
  - Limits how much the current version of Db2 needs to know about the next
  - Meters which new capabilities are available & when
- Db2 12 doesn't see any version of the 13 catalog during migration

Version
Coexistence Fallback SPE Modes FLs

1s
2s
3
4
5
6
7
8
9
10
11
12
13

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence
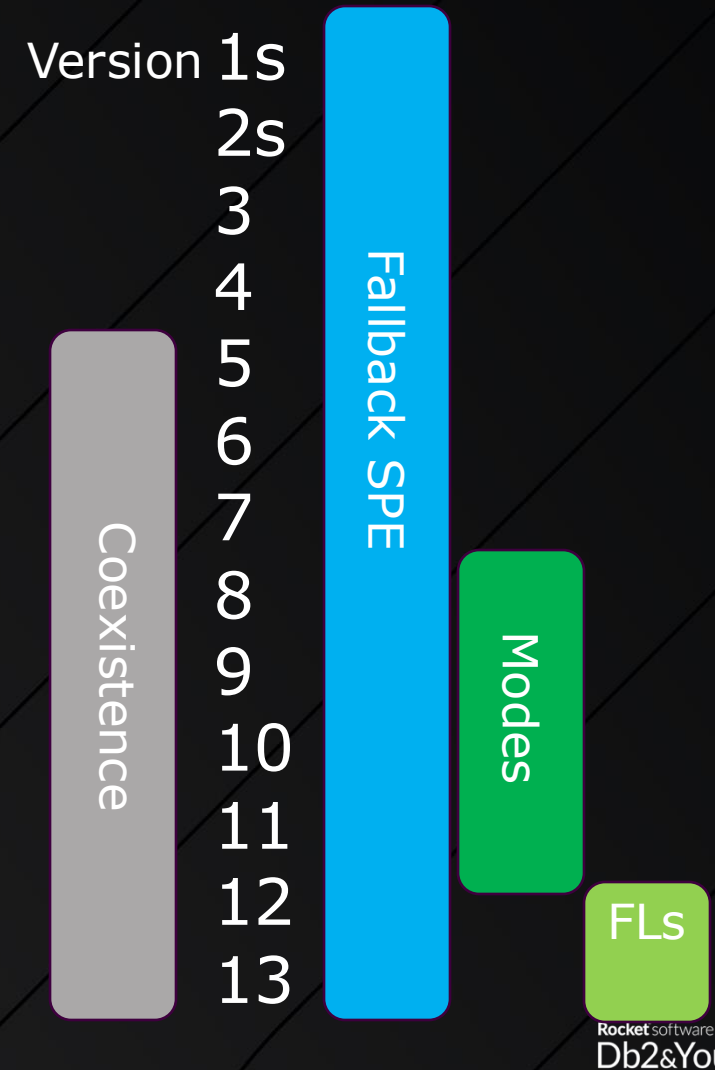
Db2 13 Readiness…
Verify for each function level

- Pre-Migration Report (DSNTIJPE/JPM) Categories
  - Db2 12 Sample Database exists
  - Deprecated / Incompatible objects
  - Items that could cause CATMAINT (DSNTIJTC) issues
  - Find incomplete definition issues for resolution
    - Some are for awareness & some automatically fixed by Db2 13
    - Report 18 may be going away, as it's not relevant (RLST table updates were required before Db2 12)

- Parameter changes, understand potential incompatibilities
  - Removed 17
    - Ex: HONOR_KEEPDICTIONARY(NO), REALSTORAGE_MANAGEMENT(AUTO)
  - Change 18
    - Ex: REORG_INDEX_NOSYSUT1 (ignored), STATPGSAMP (enacted for LOAD/REORG TABLESPACE w/inline stats) @ FL500
  - Added 11
    - Ex: UTILITY_HISTORY(NONE), PACKAGE_DEPENDENCY_LEVEL(STATEMENT)

- Deprecated function
  - The same as documented for Db2 12

…Db2 13 Readiness

Verify for each function level

- **Incompatibilities**
  - FL100
    - Db2 13 does not support the runtime structure of a Plan/Package bound before Db2 11
      - ABIND YES or AUTO will autobind old Plans/Packages
    - IFCID 402 counters are reset with START PROFILE
      - With PH50729
      - DDF_COMPATIBILITY parm is gone in v13
        - RESET_IFCID402 was an option in Db2 12
    - MAX_UDF(2000)
      - With PH44833
      - Within a thread
      - May have previously been unlimited
  - FL502
    - With Package statement level invalidation
      - VALID value of S is added
      - Same meaning as VALID=N
  - FL504
    - With Package statement level invalidation
      - Autobind may return different codes
  - Review subsystem parameter changes
  - Review ++HOLD & APAR closing text
    - This may reveal considerations for specific implementations
    - "AO" is used to mark changed messages

IFCID 239, 366, 376 assist in finding incompatibilities
- 239, package level reporting
- 366, incompatible functions executed
- 376, statement level reporting

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Red Alerts

- Verify if something is waiting to cause trouble
- As of May 2025, Db2 for z/OS appears in the following:
  - 2024.06.21 Db2 12 and DB2 13
    - Undetected data loss exposure using PBR RPN in data sharing
    - This is associated with migration to Db2 13
  - 2020.07.23 Db2 12
    - Undetected data loss exposure when using insert algorithm 2 ("IAG2") feature
  - Older alerts exist for version 7 - 11

MIG

Migration Steps

- There are 27 Migration Steps

  - With additional steps for ACTIVATE conversations beyond FL100

  - [Migrating your Db2 subsystem to Db2 13](#)

- Activating function level beyond FL100

  - Documented in the What's New guide

  - [Db2 13 function levels](#)

*Optional
- Could mean it is at your discretion, or
- It is for installation and likely not needed for migration

Rocket software
Db2&You | Rocket software Z COE
Z Center of Excellence

Staying current

- Before advancing the CL or FL make sure that applied PTFs for the CL/FL will not be backed off

  - Recommend that you run on a ML for several weeks before a week or 2 before CATMAINT or ACTIVATE

- At Db2 start up, checks of the ML, CL, and FL are done

  - If a discrepancy is found, Db2 will not start

- Consider post-maintenance preparations (sampling)

  - DSNTIJSG (dynamic SQL programs)

  - DSNTEJ2A (DSNTIAUL)

  - DSNJTM (DSNTIAD, DSNREXX)

  - DSNTEJ1L (DSNTEP2, DSNTEP4)

Migration Customization...

- DSNTINST
  - Panel driven customization

```
           DB2 13 INSTALL, UPDATE, MIGRATE AND PROVISION - MAIN PANEL
===>
Will the installation/migration be performed with z/OSMF?
    USE Z/OSMF WORKFLOW   ===> NO        Yes or No (Yes for Provision)

Check parameters and reenter to change:
   1 INSTALL TYPE         ===> ACTIVATE    Install, Migrate, Activate, Update
                                           or Provision
   2 DATA SHARING         ===>             Yes or No (blank for Activate, Update)

For migration only: Enter the data set and member name with the settings from
the previous Installation/Migration:
   3 DATA SET(MEMBER) NAME ===>
For Db2 SMP/E libraries (SDSNLOAD, SDSNMACS, SDSNSAMP, SDSNCLST, etc.), enter:
   4 LIBRARY NAME PREFIX  ===> DSND10
   5 LIBRARY NAME SUFFIX  ===>
For install data sets (NEW.SDSNSAMP, NEW.SDSNCLST, RUNLIB.LOAD, etc.), enter:
   6 DATA SET NAME PREFIX ===> DSND10.PBC0
   7 DATA SET NAME SUFFIX ===>
Enter to set or save panel values (by reading or writing the named members):
   8 INPUT MEMBER NAME    ===> C0TID504  Default parameter values
   9 OUTPUT MEMBER NAME   ===>           Save new values entered on panels
PRESS:  ENTER to continue   RETURN to exit   HELP for more information
```

```
EDIT               DSND10.PBC0.M505.SDSNSAMP
Command ===>
            Name      Prompt      Size    Created
_____  DSNTIJAF
_____  DSNTIJIC
_____  DSNTIJOZ
_____  DSNTIJTC
_____  DSNTIJUA
_____  DSNTIJUZ
_____  DSNTIJX2
            **End**
```

- DSNTIJBC
  - Customization via batch (DSNTINSB)
  - Runs the DSNTIFMT program

```
BATCH_MODE=YES
USE_ZOSMF_WORKFLOW=NO
INSTALL_TYPE=ACTIVATE
DB2_SMPE_LIBRARY_NAME_PREFIX=DSND10
DB2_SMPE_LIBRARY_NAME_SUFFIX=
INSTALL_DATA_SET_PREFIX=DSND10.PBC0.M504
DEFAULT_PARAMETER_INPUT_MEMBER=C0TID503
PARAMETER_OUTPUT_MEMBER=C0TID504
TARGET_FUNCTION_LEVEL=V13R1M504
*
***************************************************
*  OPTIONAL PARAMETERS for activating a Db2 fur
```

DSNTIDOA (OM & ON for migration)

```
//* * * * * * * * * * * * * * * * * * * * * * * *
//*     STEP02    Run DSNTINSB
//* * * * * * * * * * * * * * * * * * * * * * * *
//STEP02    EXEC BATISPF,COND=(4,LT)
//SYSTSIN   DD   *
   ISPSTART CMD(%DSNTINSB +
      OVERPARM(SSUSER1.PBC0.JCL.CNTL(DSNTIDOA))  +
      ) BREDIMAX(1)
//*
```

DSNTIJBC

Produces <prefix>.SDSN* libraries

```
DSNT467I OUTPUT MEMBER SHOULD BEGIN WITH DSNTID
DSNT478I BEGINNING EDITED DATA SET OUTPUT
DSNT489I CLIST EDITING 'DSND10.PBC0.NEW.SDSNSAMP(DSNTIJTC)', INSTALL JCL
DSNT489I CLIST EDITING 'DSND10.PBC0.NEW.SDSNSAMP(DSNTIJAF)', INSTALL JCL
DSNT489I CLIST EDITING 'DSND10.PBC0.NEW.SDSNSAMP(DSNTIJOZ)', INSTALL JCL
DSNT489I CLIST EDITING 'DSND10.PBC0.NEW.SDSNSAMP(DSNTIJX2)', ACTIVATE JCL
DSNT489I CLIST EDITING 'DSND10.PBC0.NEW.SDSNSAMP(DSNTIJIC)', INSTALL JCL
DSNT489I CLIST EDITING 'DSND10.PBC0.NEW.SDSNSAMP(DSNTIJUZ)', INSTALL JCL
DSNT489I CLIST EDITING 'DSND10.PBC0.NEW.SDSNSAMP(DSNTIJUA)', INSTALL JCL

DSNTINSB PROGRAM COMPLETED SUCCESSFULLY, INSTALL JCL(S) GENERATED.
```

These processes ask for your current Function Level, but then generate as if you might possibly be converting from FL500

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Db2 13 for z/OS Migration Mechanics

Migration Visualized

Fallback / Coexistence window

Db2 12 DSNTIJPE w/ PH33727

Db2 12 V12R1M510

Db2 13 V13R1M100

Db2 13 V13R1M500

Db2 13 V13R1M501

CATMAINT
ACTIVATE

Db2 13 V13R1M5xx

ACTIVATE
- Remains CL509

CATMAINT
- Member level
- Coexistence possible
- Fallback possible
- No Cat/Dir structure changes

ACTIVATE
- All members must be V13R1M100
- Direct to FL5xx possible

CATMAINT
- Dependent on the included FL requirements

ACTIVATE

CATMAINT (JTC)
- Specify the UPDATE CL or FL
  - CATMAINT will determine the CL for the FL
- Bundling of CATMAINT performed when needed

ACTIVATE FUNCTION LEVEL (x) [TEST]

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Db2 13 for z/OS Function & Catalog Levels...

Catalog levels in Db2 13

- FL 100
  - There are no Catalog / Directory changes
- FL 500 (CL remains 100)
  - There are no Catalog changes
  - Directory spaces SPT01 & SYSLGRNX
    - Converted to DSSIZE 256 (was 64)
    - Implemented with first REORG TABLESPACE for those spaces
    - Expect space increase
- FL501 (CL 501)
  - This is the first Function Level that implements catalog-dependent changes for 13
  - Enables the full use of Db2 13 GA features

- It is possible to go directly to any Function Level after 500, as long as:
  - the Maintenance Level is high enough
  - Catalog Level has been implemented (CATMAINT)
    - CATMAINT will bundle CL changes together to reduce steps
- Recommended to review the included features, along with any deprecations, changes, removals that may be introduced with each function level

FL100	FL500	FL501	FL502	FL503	FL504	FL505	FL506	FL507
CL100		CL501			CL504	CL505		CL507

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

…Db2 13 for z/OS Function & Catalog Levels

Installation / migration and beyond

CL
- 100, GA (38)
  - Some new function
  - Fallback and coexistence possible
- 500, GA (17)
  - Some more new function
  - No more fallback / coexistence

CL
- 501, GA (4)
  - Installations start here
  - Full complement of v13 (not requiring higher FL)
- 502, 10/2022 (3), PH47891

- 503, 2/2023 (4), PH51469

CL
- 504, 10/2023 (7), PH54919
  - Verification Levels begin

CL
- 505, 4/2024 (5), PH59534

- 506, 10/2024 (8), PH62635

CL
- 507, 4/2025 (6), PH64907

- Star Function Levels
- <u>Catalog Levels</u>
- FL507
- FL505
- FL504
- FL501
- FL100

(xx) Count of line items in function level
Includes the function level activation APAR when appropriate

CATMAINT...
Advancing the Catalog Level

- CATMAINT updates the Catalog Level
  - And activates FL100
  - Sample provided in DSNTIJTC

- Maintenance Levels with Catalog changes will have a CATMAINT
  - These historically are part of a Function Level

- Not all Function Levels change the Catalog Level
  - This is why your indicated Catalog Level could be <= your Function Level

- Can be bundled into a single execution
  - CLs executed sequentially

FL100	FL500	FL501	FL502	FL503	FL504	FL505	FL506
CL100		CL501			CL504	CL505	

One CL at a time

| CATMAINT – CL & FL | CATMAINT – CL | | | CATMAINT – CL | CATMAINT – CL |

Bundling CLs

| CATMAINT – CL & FL | CATMAINT – CL |

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence
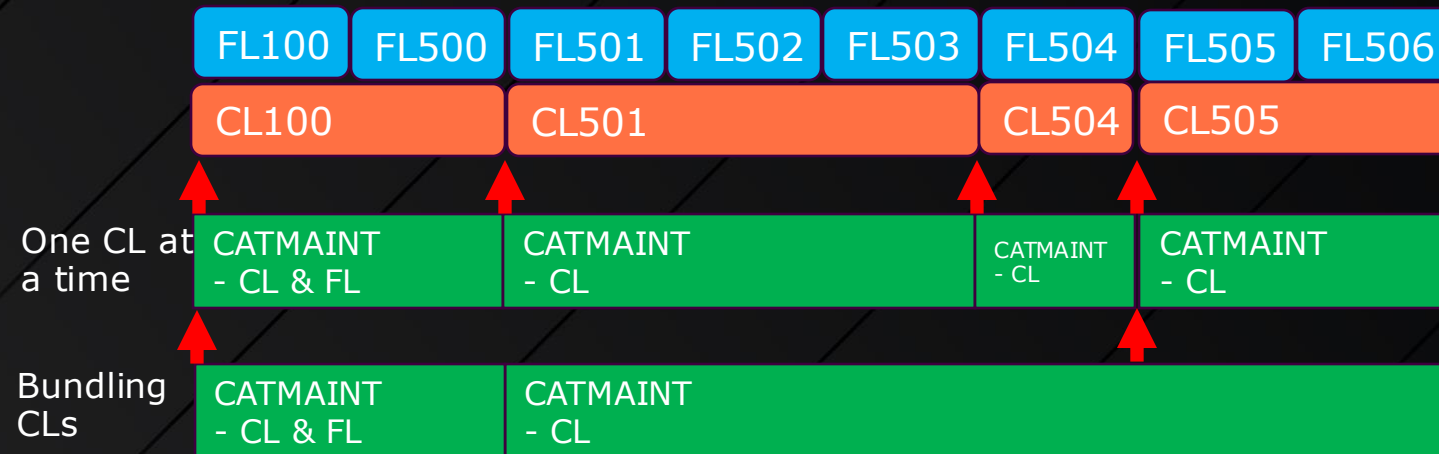
…CATMAINT
Advancing the Catalog Level

- Designed to tolerate failures
  - If there is a failure:
    - Completed CL remain in place
    - Specific failed CL is backed
  - Terminate the utility
    - When bundling CATMAINTs, completed CLs remain in place
    - Backs out to the last completed CL
  - Restart to continue
    - After resolving the issue
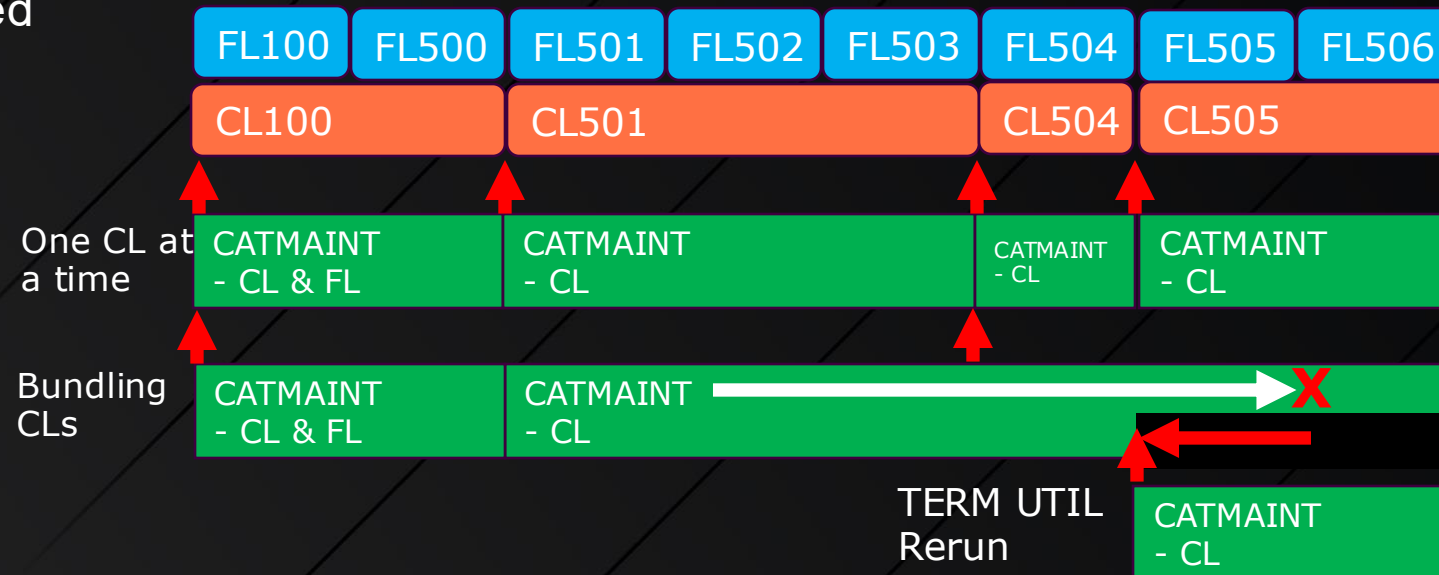
DSNTIJRT
Db2 supplied routines

- Can also specify the APPLCOMPAT for the installed routines
  - PH50704 adds the RTN_PKG_APPLCOMPAT option
  - RTN_PKG_APPLCOMPAT(DEFAULT) will use the APPLCOMPAT ZPARM
    - Note: ZPARM APPLCOMPAT of V10R1 will cause failure of DSNADMEM package (ADMIN_EXPLAIN_MAINT)
- MQ ADMIN ID(S) for access to MQ tables

DSNTIJXZ
DSNTXAZP – Refresh DSNTIDxx for installation CLIST

- Discovers more parameters
  - Install SQL, Package, Grantees
  - IVP IDs, storage groups, and COPY data set prefixes
  - Log copy prefixes, number of logs, and SMS information
  - BSDS names
  - DDF parameters
  - Routine creators and environments information
  - Db2 command prefix
  - DSNHDECP parameters
  - Catalog size
  - IRLM parameters
  - Subgroup attach
  - Workfile database information

Db2 13 for z/OS Migration

Readiness

- **Db2 12 new function APARs built into Db2 13**

- Instrumentation
  - DISPLAY GROUP DETAIL
    - Migration readiness (PH50072)
    - During coexistence, when run on a Db2 12 member, may see:
      - CL, FL, HAFL of V13R1M100
      - And a HPFL of V12R1M510
      - With MIGRATION TO <rel> IN PROGRESS
  - SYSLEVELUPDATES
  - History of CL & FL activations
  - GET_CONFIG stored procedure
    - XML input and output
  - ACTIVATE…TEST command
    - DSNTIJAF batch example

```
DSN7100I  !DSAC DSN7GCMD  581
*** BEGIN DISPLAY OF GROUP(.......) CATALOG LEVEL(V12R1M509)
                         CURRENT FUNCTION LEVEL(V12R1M510)
                         HIGHEST ACTIVATED FUNCTION LEVEL(V12R1M510)
                         HIGHEST POSSIBLE FUNCTION LEVEL(V12R1M510)
                         PROTOCOL LEVEL(2)
                         GROUP ATTACH NAME(....)
--------------------------------------------------------------------
DB2          SUB                      DB2    SYSTEM    IRLM
MEMBER   ID  SYS  CMDPREF    STATUS    LVL    NAME      SUBSYS IRLMPROC
-------- --- ---- -------   --------  ------  -------  ----- --------
........   0 DSAC !DSAC      ACTIVE    121510 SS01      IR02   DSACIRLM
--------------------------------------------------------------------
MIGRATION READINESS REPORT
--------------------------
DB2        CODE      SPE       MIGRATION
MEMBER     LEVEL     APAR      ELIGIBLE
-------- --------- -------   ---
........  V12R1M510 PH37108   YES
MIGRATION READINESS STATUS: SUBSYSTEM IS READY FOR DB2 13
--------------------------------------------------------------------
SPT01 INLINE LENGTH:        32138
*** END DISPLAY OF GROUP(.......)
```

CATALOG LEVEL = CL
CURRENT FUNCTION LEVEL (CFL) = FL
HIGHEST ACTIVATED FUNCTION LEVEL (HAFL) = FL
          > CFL when reverted (star modes)
HIGHEST POSSIBLE FUNTION LEVEL (HPFL) = ML when unconstrained
          Constrained, ML=DB2 LVL

33

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Finding the right windows

- DISPLAY BLOCKERS
  - Example: -DIS BLOCKERS(DSNDB*) DETAIL
- SELECT Blockers
  - Example: SELECT * FROM TABLE(BLOCKING_THREADS('*'));


```
REPORT: DISPLAY BLOCKERS REPORT

T LT DBNAME    DBID  NAME      OBID  AGE (SHORT)  TOKEN  MEMBER
- --  ------   ----  -------   ----  ----------   -----  ------
C 80 DSNDB06   0006  SYSTSDBA  07E2  0.000309 S
             CONNID:  PBC0
             CORRID:  011.DISPLB01
             AGE:     0.000309 S
             USERID:  SYSOPR
             LUWID:   ROCKNET1.PBC0DB2.E0BF4FBAD3C1
             DURATION: CM
             ACQUIRED: 2025-04-16-08.48.16.309641645996

T LT DBNAME    DBID  NAME      OBID  AGE (SHORT)  TOKEN  MEMBER
- --  ------   ----  -------   ----  ----------   -----  ------
C 80 DSNDB06   0006  DSNDDH01  006B  0.000309 S
             CONNID:  PBC0
             CORRID:  011.DISPLB01
             AGE:     0.000309 S
             USERID:  SYSOPR
             LUWID:   ROCKNET1.PBC0DB2.E0BF4FBAD3C1
             DURATION: CM
             ACQUIRED: 2025-04-16-08.48.16.309641645996

INFO: DIAGNOSTIC AND INFORMATIONAL MESSAGES

T DBNAME     MEMBER     INFORMATIONAL DESCRIPTION
- ------     ------     -------------------------
I DSNDB04               NO LOCKS OR CLAIMS FOR THE DATABASE
I DSNDB07               NO LOCKS OR CLAIMS FOR THE DATABASE
I DSNDB01               NO LOCKS OR CLAIMS FOR THE DATABASE

DSN9022I !PBC0 DSNZACMD '-DISPLAY BLOCKERS' NORMAL COMPLETION
```

DISPLAY BLOCKERS command   **BLOCKING_THREADS table function**

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Activating Function Levels above FL500...

- Using the DSNTINST or DSNTIJBC, 7 Jobs are generated
  - JTC for CATMAINT
  - JX2 to CHECK indexes
  - JAF to ACTIVATE
  - JUZ to update ZPARM APPLCOMPAT
  - JOZ to SET SYSPARM
  - JUA to update HDECP SQLLEVEL
  - JIC for a Cat/Dir backup

Optional
Run to update Apps for new features

Optional
Only needed if CATMAINT structural changes

- Depending on your activation approach & APPLCOMPAT management, not all of these jobs are needed

FL100	FL500	FL501	FL502	FL503	FL504	FL505	FL506	FL507
CL100		CL501			CL504	CL505		CL507

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

7 Things to Prepare Now

1. **EDUCATION**:
   Acquiring Db2 13 for z/OS information
   - Conferences, DUGs, YouTube, Partners
   - Db2 for z/OS and its ecosystem
   - What's New, Redbook (references)
   - Db2&You*

2. **REQUIREMENTS**:
   Make sure V12 systems are ready, or there's a plan
   - V12R1M510
   - Fallback SPE / IRLM Maintenance

3. **PREPARATION**:
   Use Db2 12 assets for validation, expediting Migration steps 1 – 3
   - DSN1COPY, CHECK DATA/INDEX (RUNSTATS) for Cat/Dir
   - DSNTIJPE Pre-Migration job, DSNTESQ integrity SQL
   - DSNTIJXZ to update prepare for running the 13 DSNTINST
   - Db2 12 IVP in place
   - Catalog / Directory image copies (DSNTIJIC)

4. **MEDIATION**:
   Plan / Package maintenance
   - Address old Plans / Packages (older than V11)
   - PLANMGMT
     - Free inactive packages
     - Establish new Original Packages for migration

5. **ASSESS**:
   Assess Incompatibilities, Deprecations, Removed items
   - Including removed System Parameter and default changes

6. **THIRD PARTIES**:
   Check with your tool vendors for needed toleration / exploitation

7. **PROJECT PLANNING**:
   Gather your project team
   - Functional Inventory*
   - Project Plan*
   - Determine responsibilities and testing domains

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Db2 13 Readiness / Validation

Preparation, Mitigation, Planning

• Functional Inventory*	Db2&You*, Documentation (Changes to plan for 13)
• Migration Readiness	DISPLAY GROUP DETAIL
• Integrity Checking	DSN1COPY*, CHECK DATA/INDEX*, DSNTESQ
• Pre-migration Reports^	DSNTIJPE (PH57016)
• Db2 12 IVP	DSNTExx
• Db2 12 APARs not in FL	Documentation
• Deprecations^	DSNTIJPE, Documentation
• Incompatibilies^	DSNTIJPE, Documentation
• Default changes^	Documentation
• Removals (Desupported)^	Documentation
• Pre-migration Reports^	DSNTIJPM
• Db2 13 IVP	DSNTExx

V12 assets

V13 Assets

All Db2 13 deprecations existed for Db2 12 as well

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

References

Good information

- [Db2 13 for z/OS What's New](#), GC28-2784
- [Db2 13 for z/OS Knowledge Center](#)
- [IBM Db2 13 for z/OS and More Redbook](#), SG24-8527
- [IBM Db2 13 for z/OS Performance Topics](#), SG24-8536-00
- [PDF format manuals for Db2 13 for z/OS](#)
- [Program directories for Db2 13](#) (PDF)
- [IBM zSeries Red Alerts](#)
- [Db2 for z/OS News from the Lab blog](#)
  - Db2 for z/OS and its ecosystem

Rocket software
Db2&You

Rocket software
Z COE
Z Center of Excellence

Z Concierge Program

The Z Concierge Program is a complimentary offering designed to ensure your success with the implementation and use of your IBM products. It provides guidance and knowledge transfer to help you quickly realize value from your IBM tools to maximize your mainframe investment.

Z Concierge – dedicated to **your** success.

Get started on the
PATH TO SUCCESS

→

SAVE TIME
on installation and deployment

SHORTEN
your learning curve

DIRECT ACCESS
to technical experts

Contact us to learn more:
zconcierge@rocketsoftware.com

Rocket software

Paul Bartak

Distinguished Engineer

pbartak@rocketsoftware.com

db2andyou@rocketsoftware.com